

## CLAIMS:

1. A lithographic projection apparatus comprising:
  - a radiation system to supply a projection beam of radiation;
  - a support structure adapted to support patterning structure which can be used to pattern the projection beam according to a desired pattern;
  - a substrate table to hold a substrate;
  - a projection system to project the patterned beam onto a target portion of the substrate;
  - a gas supply, configured and arranged to supply a gaseous hydrocarbon to a space containing a mirror;
  - a least one sensor selected from the group comprising a reflectivity sensor to monitor a reflectivity of said mirror and a pressure sensor to monitor a background pressure in said space; and
  - a gas supply control, responsive to a signal from said at least one sensor to control said gas supply.
2. An apparatus according to claim 1, wherein the radiation system contains said space containing the mirror.
3. An apparatus according to claim 1, wherein the radiation system comprises one of a laser-produced plasma source and a discharge source adapted to supply a beam of extreme ultraviolet (EUV) radiation as said projection beam.
4. An apparatus according to claim 3, wherein said beam of extreme ultraviolet radiation has a wavelength of less than about 50nm.
5. An apparatus according to claim 4, wherein said beam of extreme ultraviolet radiation has a wavelength in the range of from 8 to 20nm
6. An apparatus according to claim 5 wherein said range is from 9 to 16 nm.

7. An apparatus according to claim 1, wherein the hydrocarbon is an alcohol.
8. An apparatus according to claim 7, wherein the alcohol is ethanol.
9. An apparatus according to claim 1 wherein the mirror is a collector mirror.
10. A method of manufacturing a device using a lithographic projection apparatus comprising:
  - projecting a patterned beam of radiation onto a target portion of a layer of radiation-sensitive material on a substrate;
  - supplying a gaseous hydrocarbon to a space within the lithographic projection apparatus containing a mirror;
  - monitoring at least one of a reflectivity of said mirror and a background pressure in said space; and
  - controlling an amount of gaseous hydrocarbon supplied to said space in response to the monitoring.
11. A method according to claim 10, wherein the hydrocarbon is an alcohol.
12. A method according to claim 11, wherein the alcohol is ethanol.
13. A method according to claim 9, wherein said mirror comprises at least 40 multilayers and wherein the method further comprises adapting the amount of gaseous hydrocarbon supplied to the space such that at least part of at least a top layer of said mirror undergoes sputtering.
14. A method of manufacturing a device using a lithographic projection apparatus comprising:
  - projecting a patterned beam of radiation onto a target portion of a layer of radiation-sensitive material on a substrate; and
  - supplying a gaseous alcohol to a space in a radiation system of the lithographic projection apparatus, which space contains a mirror.

15. A method according to claim 14, wherein the alcohol forms a cap layer on said mirror and wherein the gaseous alcohol is supplied to said space at a pressure sufficient to achieve a thickness of said cap layer which does not increase substantially over time.
16. A method according to claim 13, wherein the alcohol is ethanol.
17. A device manufactured in accordance with the method of claim 10.

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